

II. REMARKS

Claims 1-28 were examined and stand variously rejected in the outstanding Office Action. Claim 23 has been amended in response to the section 112 rejection. Support for the amendment, as the Office recognizes, is found on page 22 lines 30 – 32 of the specification. The amendment does not raise an issue of new matter. Accordingly, entry thereof is respectfully requested.

The amendment to claim 23 is made in a sincere effort to place the claims in better condition for allowance or in better form for appeal. The amendment was not made earlier as it was made in reply to the Examiner's recent request.

After amending the claim as set forth above, claims 1-28 are now pending in this application.

A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claim Rejection - 35 U.S.C. § 112

Claim 23 is rejected under 35 U.S.C. § 112, first paragraph, for allegedly failing to comply with the written description requirement. While claim 23 recites maintaining the calcinations temperature for a time of 2 seconds to 10 h, the Office asserts, that the only time ranges disclosed in the specification are (1) a few seconds, (2) 2 seconds to several hours, and (3) 1 to 10 hours. Without conceding the correctness of the Office's

rejection and in a sincere effort to advance prosecution, claim 2 is amended to recite "2 seconds to several hours", warranting withdrawal of the rejection.

Claim Rejections - 35 U.S.C. § 103(a)

Claim 1 and claims 2-28 depending from claim 1 stand rejected under 35 U.S.C. § 103(c) as allegedly unpatentable over Nonninger *et al.* US 2004/0115416 A1, in view of Mukherjee *et al.* Ceramics International 27 (2001) 731-739; and Bitterlich *et al.* Ceramics International 28 (2002) 675-683. Applicants respectfully disagree.

1. The prior art does not teach a polymer solution

Claim 1 is directed to a method of preparing a metal oxide layer on a substrate, comprising a) dispersing a metal oxide powder in a liquid medium comprising a dispersion solvent and a dispersant, said liquid medium containing neither a plasticizer nor a binder, by means of which a suspension A of said metal oxide powder in said liquid medium is obtained, b) adding a solution of at least one polymer in a solvent to said suspension A, by means of which a suspension B is obtained, and other steps.

Nonninger *et al.*, the Office alleged, teaches a method of preparing a metal oxide layer on a substrate. However, Nonninger *et al.* does not explicitly teach, as the Office acknowledged, that the polymer added to suspension A is in a solution with a solvent. Office Action mailed July 31, 2009, page 4, item 8, emphasis added.

The Office further asserted that Bitterlich *et al.* teaches a method in which a solution of a polymer (binder) / solvent is added to the first mixture. *Id.* emphasis added. Applicants have previously submitted that, rather than disclosing a solution of polymer (binder) / solvent, Bitterlich *et al.* actually discloses a polymeric emulsion or dispersion. Response to Office Action filed May 26, 2009, page 9, first to second full paragraphs. Further, Applicants submitted that the Office failed to demonstrate that an

emulsion or dispersion of a polymer is equivalent to a polymer solution, as prescribed by the pending claims. *Id.*

In response to Applicants' arguments with respect to the polymeric emulsion and dispersion, the Office argued that the prior art has sufficiently taught polymer solutions for the following alleged reasons: 1) the specification considers a sol as a solution, 2) a sol is well known in the art as a liquid colloidal dispersion, 3) the emulsion binders of Bitterlich *et al.* are colloidal dispersions of a polymer in water, and 4) because the specification considers a sol as a solution, the medium of the prior art would be considered a solution by Applicants' standard. Additionally, the Office alleged that a number of other prior art references define solution to encompass dispersion and suspensions. Applicants respectfully disagree.

A. The term "solution" as used in the claims and specification does not encompass emulsion, dispersion or suspension

The term "solution" is not explicitly defined in the specification. Accordingly, Applicants rely on the plain and ordinary meaning of "solution". According to the online Merriam-Webster dictionary, a solution is a homogeneous mixture formed by mixing a solid, liquid, or gaseous substance with a liquid or sometimes a gas or solid, especially a single-phase liquid system. Online Merriam-Webster dictionary, <http://www.merriam-webster.com/>, last accessed January 28, 2010, emphasis added. Emulsions, dispersions and suspensions based on their ordinary meanings, on the other hand, are not homogeneous mixtures and certainly are not single-phase liquid systems, because, for example, a suspension denotes a substance in a state where particles are mixed with but undissolved in a fluid or solid. Online Merriam-Webster dictionary, <http://www.merriam-webster.com/>, last accessed January 28, 2010, emphasis added.

Second, the specification and the claims use the term "solution" in a way that clearly differentiates a solution from an emulsion, a dispersion or a suspension. For

example, "dispersion" and "suspension" are both used to describe the suspension prepared at step a). See, e.g., page 9, lines 10 to 13 of the specification. Further, the term "dispersed suspension" is defined to denote "a dispersion of a 'dry powder' in an aqueous or organic solvent." *Id.* page 9, lines 15-16. The term "solution", on the other hand, is solely used to denote the polymer solution, which enables obtaining "a homogenous and covering film from the suspension. *Id.* page 12, lines 13-15, emphasis added. The consistently differentiated uses of these terms in the application, therefore, indicate that "solution" and "dispersion/suspension" have distinct meanings.

Finally, use of the terms "solution" and "sol" side by side in the specification does not give the term "solution" the meaning of "sol" or vice versa. Needless to say, Applicants assert, that the term "sol", when used in the context of organic chemistry, can refer to a solution.

Accordingly, based on the plain and ordinary meaning of the term and Applicants' use of the term in the specification and claims, "solution" refers to a homogenous single-phase liquid mixture of at least one polymer and the solvent, and does not encompass an emulsion, a dispersion or a suspension.

B. Bitterlich et al. does not teach a polymer solution

As provided above, the Office argued that because the specification considers a sol as a solution, the medium of Bitterlich *et al.* would be considered a solution by Applicants' standard.

As a matter of law, the Office erred in using the meaning of a term in one patent or patent application to interpret the claim in a different patent or patent application. The U.S. PTO has long recognized that an applicant is entitled to be his or her own lexicographer. MPEP 2111.01(IV). Therefore, absence an indication that Applicants intended such an interpretation, the meaning of a term in one patent or patent

application may not be properly used to interpret the same term in other patents or patent applications. The Office has not provided evidence that Applicants intended such an interpretation.

Further, as a matter of fact, as explained in Section A above, the specification does not consider a sol, by which the Office referred to as an colloidal mixture such as an emulsion, a dispersion or a suspension, a solution.

Therefore, Bitterlich *et al.* does not teach the use of a polymer solution in preparing a metal oxide layer on a substrate. Accordingly, the prior art references, as cited by the Office, do not teach the use of a polymer solution in preparing a metal oxide layer on a substrate.

2. *The prior art does not teach that the sequence of adding the dispersant and the polymer is critical*

As prescribed by claim 1, the polymer solution is added into the suspension after the dispersant is added.

The Office acknowledged that Nonninger *et al.* does not explicitly teach that "the polymer is added separately and following to the dispersant." Office Action mailed July 31, 2009, page 4, item 8. Nevertheless, the Office argued that Mukherjee *et al.* "teaches that it is well-known in the art that the sequence of adding additives to a suspension is critical, namely the dispersant has to be added before the other polymeric additives to properly break down any agglomerates thus generating a proper dispersion." *Id.* Then the Office concluded that "it would have been obvious for the man skilled in the art to have added the polymer/binder species subsequent to the dispersant, as taught by Mukherjee, to avoid competitive absorption and break down the agglomerates in the method of Nonninger." Applicants respectfully disagree.

In section 2.2. entitled "slurry preparation", Mukherjee *et al.* provides that:

The powder was first milled in solvent containing a dispersant using ZrO_2 as a milling media for 12 hours. This step breaks down agglomerates which may be present in the powder. In the second step, the required amount of binder and plasticizers were added to the suspension and milled for another 24 h before final casting or rheological measurements.

Page 732, section 2.2

Mukherjee *et al.* in this paragraph does not teach that the sequence of adding the dispersant and the binder is critical. Rather, it teaches that the powder agglomerates should be broken down by wet milling in a first step, before adding, in a second step, the binder and plasticizers. The fundamental and essential action carried out during the first step is actually a mechanical and grinding action, which is achieved by using ZrO_2 as milling media during a long time period (12 hours) to break down agglomerates. The action of the dispersant is not essential during the first step. Clearly, therefore, the agglomerates are broken down by the mechanical, high energy and prolonged milling and not by the action of the dispersant.

Accordingly, the skilled artisan would have rather concluded, from the disclosure of Mukherjee *et al.*, that the polymer and plasticizers should be added after a wet milling step and not that the dispersant should be added before the binder and plasticizers. By contrast, in the method of the current invention, the suspension may optionally be ultrasonically stirred for a few minutes. See, e.g., page 19, lines 4 to 7.

Therefore, Mukherjee *et al.* does not teach that the sequence of adding the dispersant and the polymer is critical and thus does not teach adding the polymer after the dispersant, as prescribed by claim 1.

Because the prior art references, in the aggregate, do not teach each and every element of the claimed invention as prescribed in claim 1, the Office failed to establish a prima facie case of obviousness. Withdrawal of the rejection is therefore respectfully requested.

Claims 2-28 depend from claim 1 and thus include all elements of claim 1. Because claim 1 is not obvious over the cited prior references, withdrawal of the rejection is warranted.

III. CONCLUSION

Applicants believe that the present application is now in condition for allowance. Favorable consideration of the application as amended is respectfully requested. If a telephonic interview would advance examination, the Office is invited to telephone the Applicant's attorney at the number provided below.

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The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for any such relief that may be necessary in connection with the examination of the presently pending claims and authorize any such extension under 37 C.F.R. §1.136 and authorize payment of any such extensions fees or petition fees to Deposit Account No. 19-0741.

Respectfully submitted,

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